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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/684,684	10/15/2003	Kohei Yamanaka	Q76899	3402

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EXAMINER
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GARCIA, ERNESTO

ART UNIT	PAPER NUMBER
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3679

DATE MAILED: 10/11/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

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**Office Action Summary**

Application No.

10/684,684

Applicant(s)

YAMANAKA ET AL.

Examiner

Ernesto Garcia

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 29 April 2005 and 22 July 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) 12-20 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-11 and 21 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 October 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

### **DETAILED ACTION**

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

#### ***Restriction***

Claims 12-20 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on July 22, 2005.

#### ***Specification***

The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required: "the input shaft and the output shaft arranged relatively rotatably with respect to each other" recited in claim 11, lines 3-4, "the axial groove has an opening edge formed at an acute angle" in claim 10, lines 1-2, and "the cylindrical member is loosely fitted to the shaft member except the caulked portion" in claim 21, lines 12-13 lack proper antecedent basis in the specification.

***Claim Rejections - 35 USC § 112***

Claims 4, 5, 10 and 11 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 4, the metes and bounds of the claim is unclear. It is unclear how one of ordinary skill in the art compares the circumferential width of the caulked portion to that of a point of reference, i.e., the intersection. How and where is the width of the intersection measured?

Regarding claim 5, the claim depends from claim 4 and therefore is indefinite.

Regarding claim 10, it is unclear how the opening edge of the axial groove forms an acute angle. The drawings do not clarify by showing the acute angle and the specification fails to provide support to clarify what is being claimed.

Regarding claim 11, the metes and bounds of the claim is unclear. Lines 1-2 set forth that the structure further comprises additional features, i.e., the input shaft and the output shaft, yet lines 2 and 3 indicate that the shaft member comprises the input shaft or the output shaft, which contradicts the first clause. Further, how does the shaft member being the input shaft or the output shaft further limit the structure as claimed?

***Claim Rejections - 35 USC § 102***

Claim 21 is rejected under 35 U.S.C. 102(b) as being anticipated by Chikaraishi, 6,301,975 (see marked-up attachment).

Regarding claim 21, Chikaraishi discloses, in Figures 3 and 5B, a structure comprising a shaft member **3** and a cylindrical member **10**. The shaft member **3** is formed out of a first material. The shaft member **3** has an outer periphery **A2** formed with at least one axial groove **11**. The axial groove **11** has a cross-section having opposed faces **A5** substantially parallel to each other. The cylindrical member **10** is provided to the outer periphery **A2** of the shaft member **3**. The cylindrical member **10** is formed out of a second material greater in linear expansion coefficient than the first material (col. 1, lines 48-53). A caulked portion **11** is provided to the cylindrical member **10** at a position corresponding to the axial groove **11** of the shaft member **3**. The caulked portion **11** has a deformed inner surface in press contact with the opposed faces **A5** of the circumferential groove **12** (see Fig. 5A). The cylindrical member **10** is loosely fitted to the shaft member **3** except the caulked portion **11**. Applicants should note that the sleeve is "loosely fitted" to the shaft member everywhere there is no caulked portion or any form of connection.

***Claim Rejections - 35 USC § 103***

Claims 1, 6, 7, 9, and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Smith et al., 3,688,521 (see marked-up attachment), in view of Chikaraishi, 6,301,975.

Regarding claim 1, Smith et al. discloses, in Figure 1-4, a structure comprising a shaft member **26** and a cylindrical member **25**. The shaft member **26** is formed out of a first material. The shaft member **26** has an outer periphery **A2** formed with an axial groove **18** and a circumferential groove **21**. The axial groove **18** and the circumferential groove **21** have a cross-section having opposed faces **A5** substantially parallel to each other. The cylindrical member **25** is fitted to the outer periphery **A2** of the shaft member **26**. A caulked portion **18** is provided to the cylindrical member **25** at an intersection of the axial groove 18 and the circumferential groove 21 (col. 3, lines 19-24; Figure 4 shows an intersection). The caulked portion **18** has a deformed inner surface **A8** in press contact with the faces **A5** of the circumferential groove **21** and the caulked portion has a deformed inner surface in press contact with the opposed faces of the axial groove (col. 3, lines 19-24). However, Smith et al. do not disclose the cylindrical member **25** being formed out of a second material greater in linear expansion coefficient than the first material.

Applicants should note that it is inherent that the cylindrical member has a linear expansion coefficient different to that of the shaft member 26 to deform the material into the grooves. Further, Chikaraishi also teaches that it is common to have the second material be greater in linear expansion to be press fitted on the shaft member (col. 1, lines 48-52).

Regarding claim 6, the axial groove **18** comprises a plurality of groove portions in a circumferential direction.

Regarding claim 7, the groove portions are three in number.

Regarding claim 9, the cylindrical member **25** is loosely fitted to the shaft member **26** except the caulked portion **18**. Applicants should note that anywhere there is not a caulked portion there is no connection and thus the cylindrical member is loosely fitted to the shaft member as well.

Regarding claim 11, the shaft member **3** comprises an input shaft arranged relatively rotatably with respect to an input shaft (not shown, however it is envisioned that an input shaft is placed in the ref shaft member 26 via feature 32).

Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Smith et al., 3,688,521 (see marked-up attachment), in view of Chikaraishi, 6,301,975, as applied to claims 1, 6, 7, 9, and 11, above, and further in view of Fujioka et al., 4,716,756.

Regarding claim 8, Smith et al., as discussed, fails to disclose the axial groove **18** and the circumferential groove **21** being rectangular. Applicants are reminded that a change in the shape of a prior art device is a design consideration within the skill of the art. In re Dailey, 357 F.2d 669, 149 USPQ 47 (CCPA 1966). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to design the groove of a rectangular cross section as taught by Fujioka et al., Fig. 8.

Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Smith et al., 3,688,521 (see marked-up attachment), in view of Chikaraishi, 6,301,975, as applied to claims 1, 6, 7, 9, and 11, and further in view of Edgemon, Jr., 3,642,311.

Regarding claim 10, Smith et al., as modified, fail to disclose the axial groove **18** having an opening edge formed at an acute angle. Edgemon, Jr. teaches, in Figure 2, an axial groove **18** having an opening edge formed at an acute angle. Edgemon, Jr. does not state why the opening edge is formed at an acute angle. Applicant is reminded that side faces of a rectangular axial groove formed on a cylindrical surface inherently form an opening edge at an acute angle as part of a design consideration. Therefore, as taught by Edgemon, Jr., it would have been obvious to one of ordinary



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skill in the art at the time the invention was made to make the axial groove have an opening edge formed at an acute angle as part of forming an axial groove being rectangular on a cylindrical surface.

Claims 2, 4, and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Smith et al., 3,688,521 (see marked-up attachment), in view of Chikaraishi, 6,301,975, as applied to claims 1, 6, 7, 9, and 11, and further in view of Krude et al., 4,202,184.

Regarding claim 2, Smith et al., as modified, fail to disclose the axial groove **18** and the circumferential groove **21** being different in depth from each other. Krude et al. teach, in Figure 5, an axial groove **11** and the circumferential groove **12** being different in depth from each other to receive portions of the material of the cylindrical member which will consist of a diameter reduction of the cylindrical member and the material volume displaced by tooth portions (col. 6, lines 11-18). Therefore, as taught by Krude et al., it would have been obvious to one of ordinary skill in the art at the time the invention was made to make the axial groove **18** and the circumferential groove **21** different in depth from each other to receive portions of the material of the cylindrical member consisting of a diameter reduction of the cylindrical member and material volume displaced by tooth portions between the axial grooves.

Regarding claim 4, given the modification, the caulked portion would be greater in circumferential width than the intersection.

Regarding claim 5, given the modification, the caulked portion comprises a first caulked part corresponding to the circumferential groove **21** and a second caulked part corresponding to the axial groove **18**. The second caulked part would be arranged substantially in a middle of the first caulked part.

Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Smith et al., 3,688,521 (see marked-up attachment), in view of Chikaraishi, 6,301,975, as applied to claims 1, 6, 7, 9, and 11, and further in view of Krude et al., 4,202,184, as applied to claim 2 above, and further in view of Jackman, 2,913,290.

Regarding claim 3, Smith et al., as modified above, fail to disclose the axial groove **18** greater in depth than the circumferential groove **21**. Applicants are reminded that a mere reversal of the essential working parts of a device involves only routine skill in the art; therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to make the groove with a greater depth than that of the circumferential groove or vice versa. *In re Einstein*, 8 USPQ 167. Further, See Jackman as Figures 3-4 teach an axial groove greater in depth than the circumferential groove.

***Response to Arguments***

Applicant's arguments with respect to claims 1-11 have been considered but are moot in view of the new ground(s) of rejection.

Applicant's arguments, in respect to formerly claim 9, now claim 21, filed 4/29/05 have been fully considered but they are not persuasive.

Applicants have argued that Chikaraishi does not disclose the protrusion having a deformed inner surface in press contact with opposing walls of the axial groove. In response, applicants should note that claim 21 calls for "opposed faces substantially parallel to each other" instead of walls. Further, applicants should carefully review the marked up attachment, as the opposed faces **A5** are two faces that are substantially parallel to each other. Furthermore, the caulked portion touches these faces as best shown in cross-section in Fig. 5A. Therefore, the protrusion 13 has a deformed inner surface in press contact with the opposed faces of the axial groove. If applicants believe that the protrusion 13, once fitted within the axial groove, does not make the deformed inner surface in press contact with opposing walls, applicants need to explain why that is not occurring. In regards to the argument of the cylindrical member not being loosely fitted to the shaft member except the caulked portion, it is clear that where there is no connection, the shaft member is loose thus loosely fitted to the shaft member except at the caulked portion.

### ***Conclusion***

The following prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Arena, 4,561,799, teaches a caulked portion at an intersection.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. In particular, the new recited limitations "at an intersection of the axial groove and the circumferential groove" in claim 1, lines 10-11, and "the axial groove and the circumferential groove at the intersection" in claim 1, lines 13-14; and the deleted limitations "at least one of" in claim 1, line 3, "the at least one groove" in claim 1, line 4, "at a position corresponding to the at least one groove of the shaft member" in claim 1, lines 9-10, and "the at least one groove" in claim 1, line 4, necessitated the new grounds of rejection. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

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extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ernesto Garcia whose telephone number is 571-272-7083. The examiner can normally be reached from 9:30-5:30. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Daniel P. Stodola can be reached at 571-272-7087.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



E.G.

October 3, 2005

Attachments: one marked-up page of Smith et al., 3,688,521  
one marked-up page of Chikaraishi, 6,301,975



DANIEL P. STODOLA  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 3600

Smith et al., 3,688,521.

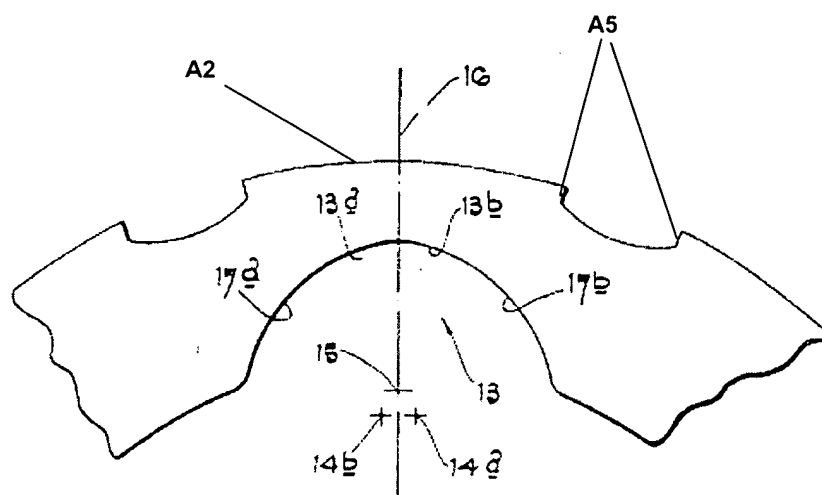


Fig. 3

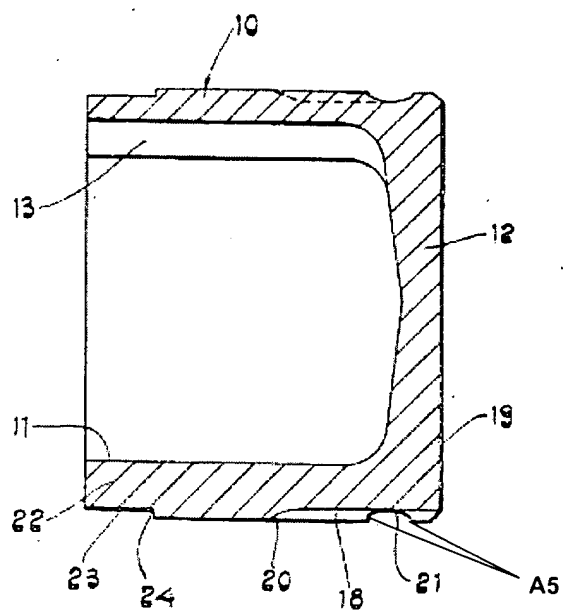


Fig. 4

FIG.3

